Natural Heritage & Endangered Species Program
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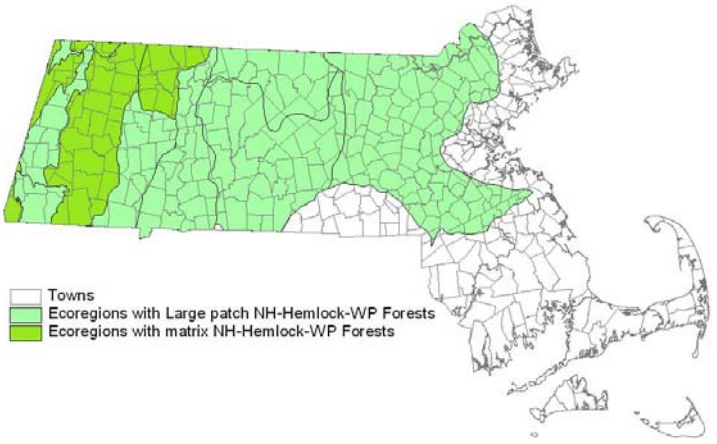
Northern Hardwoods - Hemlock – White Pine Forest

State Status: None
Federal Status: None



Description: Northern Hardwoods – Hemlock - White Pine Forests have a closed canopy dominated by a mix of deciduous and evergreen trees, with sparse shrub and herbaceous layers. This is the predominant hardwood forest of much of northern New England, and the cooler parts of Massachusetts. It is broadly defined and is characterized by variability among the dominant species.

Environment: The community shows its best development on moist, fertile well drained soils in cooler parts of the state and on north facing slopes. It is widespread in dry to mesic, moderately to barely acidic conditions with moderate levels of nutrients within the cooler areas.

Characteristic Species: The forest is generally dominated by a mix of sugar maple (*Acer saccharum*), beech (*Fagus grandifolia*), and yellow birch (*Betula alleghaniensis*), in variable proportions, mixed with hemlock and white pine. Beech tends to dominate on drier sites.

Occurrences with large proportions of white pine are usually recovering from a past disturbance where the land was open, including natural large wind throws, heavy logging, and lands cleared for farming or pasture. Hemlock may dominate in ravines or cool edges of wetlands.

Red oak (*Quercus rubra*) is the only oak species expected in the Northern Hardwoods communities. Black cherry (*Prunus serotina*), white birch (*Betula papyrifera*), red maple (*Acer rubrum*), and other early successional tree species are often scattered in Northern Hardwoods forest occurrences in a subcanopy with striped maple (*Acer pensylvanicum*), and sometimes hop-hornbeam (*Ostrya virginiana*).

The shrub layer is usually sparse, but may have clumps of hobblebush (*Viburnum lantanoides*) or red-berried elderberry (*Sambucus racemosa* ssp. *pubens*) Individuals of fly-honeysuckle (*Lonicera canadensis*) or skunk currant (*Ribes glandulosum*) are characteristically present.

The diverse but sparse herbaceous layer includes Christmas fern (*Polystichum acrostichoides*), Canada mayflower (*Maianthemum canadense*), clubmosses (*Lycopodium* and other species in the group), wild sarsaparilla (*Aralia nudicaulis*), and white wood aster (*Eurybia divaricata)*. Painted trillium (*Trillium undulatum*) early yellow violet (*Viola rotundifolia*), bluebead lily (*Clintonia borealis*), and bloodroot (*Sanguineria canadensis*) appear in the spring.

Range: Variations on the Northern Hardwood community type occur from the upper Midwest to northern New England, and south along the Appalachian mountains. In Massachusetts the forest type tends to be found in the higher, cooler western part of the state, with scattered occurrences on north facing slopes and cool ravines throughout all but the southeastern part of the state. The ranges of the dominant species are larger than the range of the Northern Hardwoods-Hemlock-White Pine Forest type.

Related communities: To the south or in warmer areas, the community grades into the Oak-Hemlock-White Pine Forest. To the north, at higher elevations, and in cooler areas, it grades into Spruce-Fir-Northern Hardwoods. Within the area dominated the Northern Hardwood matrix forest, a variety of variants have been identified and named. Rich, Mesic Forest Communities occur on rich, moist soils, are usually dominated by Sugar Maple, and are known for a particularly diverse spring herbaceous flora. Red Oak-Sugar Maple Transition Forests have species of northern hardwoods and central hardwoods (oaks and hickories) together, but few of the more northern species. Hemlock ravine communities may be separated when hemlocks dominate in large enough areas to name. This matrix forest type includes many patch and small patch communities within its geographic extent. When the matrix community is mapped, there is an implicit recognition that it includes small patch community types such as occur on specialized conditions within the broad area of the prevailing forest type. Examples include rocky outcrops, rock cliffs, forest seeps, and wetlands. For conservation planning, the largest areas of common types of matrix

forest are considered to be the most important to protect, since they will include the most diversity and provide the most habitat for animals.

Management considerations: Control of non-native invasive species may be the most important management activity to maintain Northern Hardwood forests. Invasive non-native species alter the habitat and occupy space that native species would otherwise use. Monitoring conservation land, and removing non-native species before they become a problem and impact native species is important. For those areas where vehicles are in use, either for timber harvest or recreation, cleaning vehicles before entering the forest to remove seeds or other 'propagules' (pieces of plants that might grow) trapped in mud on the vehicles, is a good step to stop the spread of invasives. Many species of invasives do well in the conditions in which Northern Hardwoods Forests grow: preventing invasives from becoming established is an important step to maintaining the appropriate native biodiversity of the forests.

There are a variety of diseases and insects that attack individual tree species that occur in Northern Hardwoods Forests. Maintaining large and naturally diverse forests may be a major step to hinder movement of pathogens among individuals.

Status in Massachusetts: This forest type is ranked as S5 in Massachusetts, meaning it is considered to be secure in the state. However, as in most of Massachusetts' natural communities, 350 years of European settlement has changed the proportion of species and species composition in the community. Protection of the least impacted occurrences provides an insight into the original forests of the state. There are some areas of remnant Old Growth occurrences of Northern Hardwood-Hemlock-White Pine Forests. Most of these are on state land and have been identified and protected. Most Old Growth is in Forest Reserves that include other forests that will also be left to develop naturally. The Old Growth areas are important to protect, but they are not necessarily typical of the pre-settlement forest type: they were left uncut because of occurring on steep slopes or in boulder fields. Additional forest areas with minimal past disturbance have been identified for protection and inclusion in large forest blocks. Central areas in large blocks of forest are being managed for 'interior forest' to provide protected habitat for species needing those conditions. Many of these areas are in western Massachusetts where Northern Hardwoods – Hemlock – White Pine Forests predominate.

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. Photograph of Northern Hardwoods – Hemlock – White Pine Forest showing the diversity within sites. Here deciduous northern hardwoods dominate one slope and hemlock the other. Hobblebush flowers along the stream. The relatively open understory below the hardwoods is typical. Photo: P. Swain.